Remarks

Claims 1-37 are now pending in this application. Applicants have not amended the claims. Applicants respectfully request favorable reconsideration of this application.

Claims 7-31 stand as withdrawn from consideration by the Examiner as being directed to non-elected inventions.

The Examiner objected to the amendment filed February 15, 2008, asserting that it introduced new matter. The endpoints for the ranges and annealing temperature were present in claims as originally filed, in particular in claim 7. The claims are part of the application as originally filed. Therefore, the endpoints for the ranges and annealing temperature were present in the application as originally filed and do not constitute new matter. Applicants have imported the text describing the endpoints for the ranges and annealing temperature into the specification. Accordingly, Applicants respectfully request withdrawal of the objection to the amendment.

The Examiner rejected claims 1, 5, 32, 36, and 37 under 35 U.S.C. § 103(a) as being unpatentable over U.S. patent 6,218,680 to Carter, Jr. et al. The Examiner rejected claims 3, 4, 6, and 33 under 35 U.S.C. § 103(a) as being unpatentable over Carter, Jr. et al. in view of U.S. patent 5,043,773 to Precht et al. The Examiner rejected claims 34 and 35 under 35 U.S.C. § 103(a) as being unpatentable over Carter, Jr. et al. in view of U.S. patent 5,736,430 to Seefeldt et al.

Carter, Jr. et al. does not suggest the invention recited in claim 1 since, among other things, Carter, Jr. et al. does not suggest a uniform silicon carbide single crystal with either an n-type or a p-type conductivity, wherein the crystal has a carrier lifetime of at least 50 ns. Rather, as described at col. 3, lines 56-65, and col. 4, lines 45-46, Carter suggests a crystal that is clearly and explicitly described as semi-insulating by point defects. Semi-insulating crystals are known to have life times in the range of a few nanoseconds at best. One of ordinary skill in the art would not consider a semi-insulating crystal to exhibit n-type or p-type conductivity or to have a carrier life time of at least 50 ns, as recited in claim 1.

Additionally, Carter, Jr. et al. does not suggest a crystal that has a carrier concentration less than 10^{15} cm^{-3}. The Examiner makes assertions regarding carrier concentration, but not net carrier concentration. For example, the Examiner asserts that the crystal suggested by Carter will have a concentration of nitrogen of $5x10^{16}$ or less, citing col. 5, lines 23-26, for support. However, Applicants note that neither this concentration is the neither the same as a net carrier concentration, nor that the material by this will have n-type conductivity.

The Examiner asserts that at col. 8, lines 44-46, Carter, Jr. et al. suggests shallow donor and acceptor dopants. However, in this passage, Carter, Jr. et al. suggests an alternative embodiment, in which, for example, the nitrogen concentration need not be $5x10^{16}$ or less, but can, for example, be higher, as long as there are p-type dopants that compensate for this, and that there are intrinsic point defects in the crystal that are greater than the net amount of p-type or n-type dopants to produce the semi insulating crystal that Carter, Jr. et al. suggests.

Also, rather than suggesting a carrier life time of at least 50 ns at room temperature, Carter, Jr. et al. suggests a semi-insulating crystal by an amount of point defects. One of ordinary skill in the art would expect such crystals to exhibit a carrier lift time of about 0 ns or at most a few nanoseconds instead of at least 50 ns at room temperature, as recited in claim 1. Therefore, the Examiner's conclusion regarding this aspect of Carter, Jr. et al. is incorrect.

Applicants contentions regarding the carrier lifetimes are supported by the attached article, Jenny et al., *Effects of annealing on carrier lifetime in 4H-SiC*, Journal of Applied Physics, Vol. 100, (2006), which describes a conducting high purity SiC crystal with a high carrier life time. The crystal can be made from an as-grown semi-insulating high purity SiC crystal with low carrier life times by post-growth annealing. In the passage marked in section A. MPCD Measurements, Jenny et al. describes that semi-insulating crystals have carrier life time less than 10 ns, although this upper limit, as indicated in the text, is rather indicative of the method of measurement than the actual carrier recombination decay, which thus is less. Furthermore, in the passage marked in section B. Other electrical characterization, Jenny et al. describes semi-insulating vs. conducting and related conductivities (10E9 vs 100 Ohm cm).

Carter, Jr. et al. does not suggest a crystal that provides a drift zone of high power devices. The crystal suggested by Carter, Jr. et al. does not provide such a structure.

In view of the above, Carter, Jr. et al. does not suggest the invention recited in claim 1, or claims 5, 32, 36, and 37, which depend from claim 1. Therefore, Applicants respectfully request withdrawal of this rejection.

The combination of Carter, Jr. et al. and Precht et al. does not suggest the invention recited in claims 3, 4, 6, or 33, which depend from claim 1, since, among other things, Precht et al. does not overcome the above-discussed deficiencies of Carter, Jr. et al. For example, Precht et al. does not suggest a uniform silicon carbide single crystal with either an n-type or a p-type conductivity, wherein the crystal has a carrier lifetime of at least 50 ns or a crystal that has a carrier concentration less than 10^{15} cm^{-3}. Therefore, the combination of Carter, Jr. et al. and Precht et al. does not suggest the invention recited in claims 3, 4, 6, or 33 and Applicants respectfully request withdrawal of this rejection.

The combination of Carter, Jr. et al. and Seefeldt et al. does not suggest the present invention as recited in claims 34 or 35 since, among other things, Seefeldt et al. does not overcome the above-discussed deficiencies of Carter, Jr. et al. For example, Seefeldt et al. does not suggest a uniform silicon carbide single crystal with either an n-type or a p-type conductivity, wherein the crystal has a carrier lifetime of at least 50 ns or a crystal that has a carrier concentration less than 10^{15} cm^{-3}. Therefore, the combination of Carter, Jr. et al. and Seefeldt et al. does not suggest the invention recited in claims 34 or 35 and Applicants respectfully request withdrawal of this rejection.

In view of the above, the cited references, whether considered alone or in combination, do not suggest patentable features of the invention recited in claims 1-6 and 32-37. Therefore, the cited references, whether considered alone or in combination, do not make the present invention obvious. Accordingly, Applicants submit that the claimed invention is patentable over

the cited references.

If an interview would advance the prosecution of this application, Applicant respectfully urges the Examiner to contact the undersigned at the telephone number listed below.

The undersigned authorizes the Commissioner to charge insufficient fees and credit overpayment associated with this communication to Deposit Account No. 22-0261.

Dated: August 25, 2008

Respectfully submitted,

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